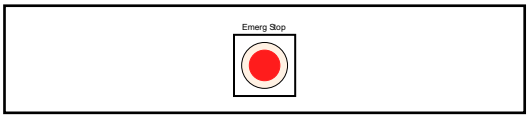
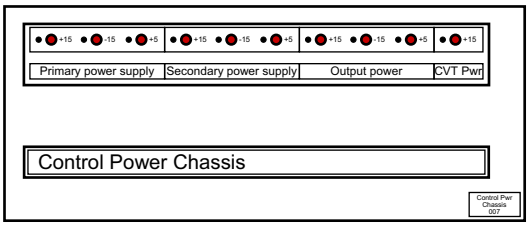
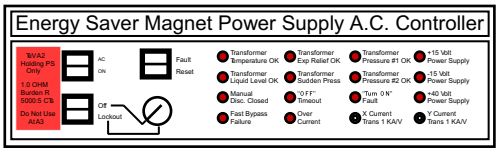


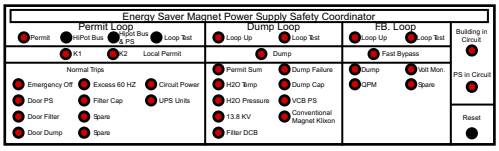
Emergency Stop
Located at the top of the relay rack, above the Control Power Chassis. When pressed, drops a logic permit to the Safety Coordinator, which dumps the ramp and prevents the power supply from turning on. Bottom line is that the permit loop drop opens the VCBs.



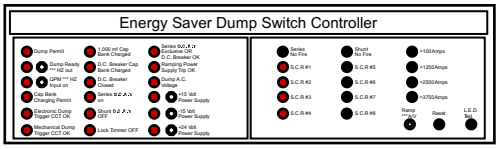
Control Power Chassis
The Control Power Chassis supplies the +5V, and +/- 15V to the modules in the TeV power supply controls rack, the A.C. Controller, Dump Switch Controller, SCR Firing Unit and the P.S. Voltage Monitor. Like a local D.C. bus



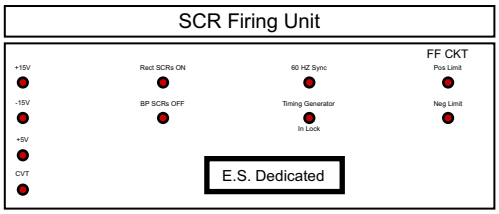
A.C. Controller
Controls the local and remote opening and closing of the House VCB, putting the supply in lockout prevents the supply from remotely turning on. Also has as inputs information about the transformer, temperature, oil, and turn on faults.



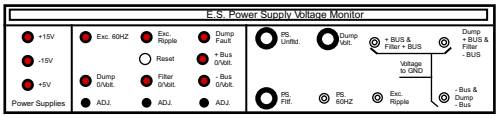
Safety Coordinator
Monitors the Permit Loop, Dump Loop and Fast Bypass Loop, if everything is okay will allow the power supply to turn on. The Permit Loop monitors some of the physical aspects of the power supply, doors closed, door filter and dump and filter cap, also gets a Emergency Off permit from the Emergency off button. The Dump Loop monitors the Dump; water temperature and pressure, dump switch okay and whether we are in hipot mode. If something is wrong with the dump it will pull the "Dump Failure" permit and prevent the power supply from turning on. The Fast Bypass Loop monitors if we have the Dump permit (from the Dump Switch Controller), if the QPMs are charged and if the power supply is at zero to start. If a loop goes down, the Safety Coordinator will pull the loop and dump the ramp. In addition on the right side tells you whether the House, the Service Building and power supply you are at is in the circuit, one of the six being used for Collider Operations.



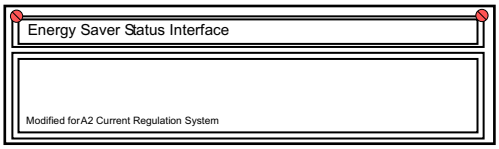
Dump Switch Controller
Monitors the dump, charged or fired, if everything is good it will give a permit to the Dump Loop via "Dump Failure" on the Safety Coordinator. If not, it will pull the permit to the Safety Coordinator which will trip the Dump Loop on the Safety Coordinator and dump the ramp. When a quench happens, the Dump switch controller needs to get rid of the stored energy in the magnets very fast, about 350 mega joules in 16 milli-seconds. It will use the electrical dump, the series shunt, or the mechanical dump, DC breaker. The DC breaker is also a backup for the series shunt. The dump switch operates in 16 mSec, but it takes tens of seconds to actually dump all 350 megajoules.



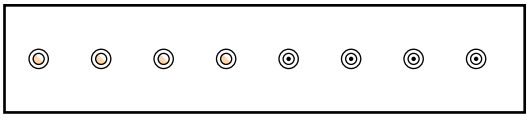
SCR (Silicon Controlled Rectifier) Firing Unit
The SCR Firing Unit is a regulator for the power supply, it phases on the SCRs in a certain order, pattern. Through the SCR Firing Unit TECAR can tell the power supply to run up to a certain value.

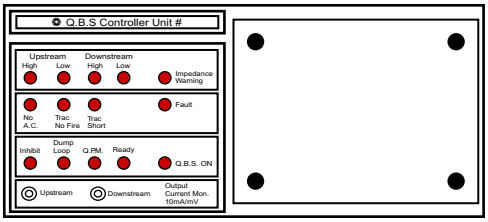


P.S. Voltage Monitor
Monitors the voltage across the power supply and dump, if there is a problem, current unstable, too much ripple, it will pull the permit to the Safety Coordinator for the Fast Bypass Loop and dump the ramp. In addition when hipotting you can get a local readout from the chassis and when the power supply is running filtered and unfiltered read backs. When we do a Dump Test and do the VFC volts to ground plot we get the data to plot off the QPMs. In addition the Hipotter supplies its own voltage and gets its own current, nothing to do with the Voltage Monitor chassis.

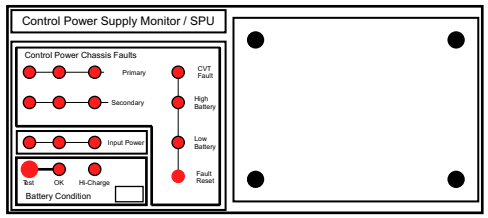


Status Interface
A multi-plexer chassis, gets inputs from Control Power Chassis, A.C. Controller, Safety Coordinator, Dump Switch Controller, SCR firing Unit, Voltage Monitor, and QBS Controller. It will take the information and send it out to T21 via the C180 CAMAC module.





QBS (Quench Bypass Switch) Control Unit
Located at the 2 houses, there are two, "A" and "B" for redundancy. They control all the QBS's in there sector, 17 QBS per sector. When a QPM detects a quench, TECAR triggers the QBS Controller to dump the magnet current as fast as possible. By shorting the quenching cell and bypassing the ring current around it. Since there are 2 QBS Control Units, is 1 for the "A" switch and the other for the "B" switch.



SPU (Standby Power Unit)
The SPU backups up the control voltage to the Control Power Chassis, if the control power chassis voltage sags, the SPU supplies power through the secondary lines to shutdown the Tevatron power supply in a controlled manner. Also the SPU backs up the CVT (Constant Voltage Transformer).